

**California Actuarial Advisory Panel**  
**Model Actuarial Funding Policies and Practices for Public Pension and OPEB Plans**  
**2012 Discussion Drafts – Version ~~5a-6a~~ – for ~~January 20~~February 23, 2012**

**Purpose and scope:**

This document develops the principal elements and parameters of a model actuarial funding policy for representative California public pension and OPEB plans, as well as other similar U.S. public sector plans. This document does not address policy issues related to benefit plans where a member's benefits are not funded during the members' working career, e.g., plans receiving "pay-as-you-go" funding or "terminal" funding.

As developed here the model funding policy is based on a level cost actuarial methodology<sup>1</sup>, which is consistent with well-established actuarial practice. The particular model that we develop is based on a combination of policy elements that has been tested over many years and, we believe, is well understood and broadly applicable. However, there are other models that practitioners may use that are internally consistent and may be as appropriate in some circumstances as the model that is developed herein, and it is not our intention to discourage consideration of such other policies. Furthermore there are situations where the policy parameters developed herein may require additional analysis to establish the appropriate parameters for that situation<sup>2</sup>. As always, it is up to the actuary to apply professional judgment to the particulars of the situation and recommend the most appropriate policies for that situation.

Our approach begins with identifying the policy objectives of such a funding policy, and then evaluating the structure and parameters for each of the particular policy elements in a manner consistent with those objectives, as well as with current and emerging actuarial science and governing actuarial standards of practice.

These model practices are intended as guidance to retirement boards<sup>3</sup> in the setting of funding policy, given the wide range of such policies currently in practice in the U.S. This development also acknowledges that the boards will require some level of policy flexibility to reflect both their specific policy objectives and their individual circumstances. To accommodate that need for reasonable flexibility and yet also provide substantive guidance, this development evaluates various policy element structures and parameters or ranges as according to the following categories:

- ◆ 1. Model practices
- ◆ 2. Acceptable practices
- ◆ 3. Acceptable but not generally recommended practices
- ◆ 4. Non-recommended practices

<sup>1</sup> Here a "level cost actuarial methodology" is characterized by economic assumptions based on the long term expected experience of the plan and a cost allocation designed to produce a level cost over an employee's active service. This is in contrast to a "market based actuarial methodology" where economic assumptions are based on current market returns and costs are allocated based on the (non-level) present value of an employee's accrued benefit.

<sup>2</sup> For example, plans which are closed to new entrants may require additional analyses and forecasts to determine whether the policy parameters herein provide for adequate funding.

<sup>3</sup> Here "retirement boards" is meant to refer generally to whatever governing bodies have authority to set funding policy for public sector plans.

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#### ◆5. Unacceptable practices

These categories are best understood in the context of the various policy alternatives. Practices which are not generally recommended ([category 3](#)) may be acceptable in some circumstances either to reflect different policy objectives or on the basis of additional analysis. Furthermore systems that ~~for practical reasons~~ adopt practices which under this model analysis are not recommended ([category 4](#)) should do so only with acknowledgment of the policy concerns identified herein.

This evaluation of practice elements and parameters was developed based on experience with the many independent public plans sponsored by counties, cities and other local public employers in California, and is intended to have general applicability to such plans. However, for some plans, ~~including California's three statewide retirement systems (CalPERS, CalSTRS, and The University of California Retirement Plan)~~, special circumstances or situations may apply. For those systems the specific applicability of the results developed here should be evaluated by their governing boards based on the advice of their advising actuaries.

Note that while the selection of actuarial assumptions is an essential part of actuarial policy for a public sector plan, the selection of actuarial assumptions is outside the scope of this discussion.

Finally note that some retirement systems have features that may require funding policy provisions and analyses that are not addressed herein. One example is systems with “gain sharing” provisions whereby favorable investment experience is used as the basis for increasing member benefits and/or reducing employer and/or member contributions. Another example is Deferred Retirement Option Programs (“DROPs”) whereby members who continue in service can accumulate a lump sum benefit based on their retirement benefits as accrued as of some “DROP” date. The policies developed here should not be interpreted as being adequate to address these plan features without additional analysis specific to those features.

#### **General Policy Objectives:**

**Note: objectives specific to each principal policy element are identified in the discussion of that policy element**

1. The principal goal of a funding policy is that future contributions and current plan assets should be sufficient to provide for all benefits expected to be paid to current active, inactive and retired members, and their beneficiaries. This means that contributions should include the cost of current service plus a series of payments or credits to fully fund or recognize any unfunded or ~~preover~~funded past service costs.
2. The funding policy should seek a reasonable allocation of the cost of benefits and the required funding to the years of service. This includes the goal that annual contributions should, to the extent reasonably possible, maintain a close relationship to the expected and actual cost of each year of service.

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3. The funding policy should seek to manage and control future employer contribution volatility to the extent reasonably possible, consistent with other policy goals.
4. The funding policy should support the general public policy goals of accountability and transparency. While these terms can be difficult to define in general, here the meaning includes that the funding policy should be clear both as to intent and effect, and that it should allow an assessment of whether, how and when the plan sponsor will meet the funding requirements of the plan.

Policy objectives 2 and 3 reflect two aspects of the general policy objective of “interperiod equity” (IPE). The “demographic matching” goal of policy objective 2 promotes *intergenerational* IPE, which seeks to have each generation of taxpayers incur the cost of benefits for the employees who provide services to those taxpayers, rather than deferring those costs to future taxpayers. The “volatility management” goal of policy objective 3 promotes *period-to-period* IPE, which seeks to have the cost incurred by taxpayers in any period compare equitably to the cost for just before and after.

These two aspects of IPE will tend to move funding policy in opposite directions. Thus the combined effect of policy objectives 2 and 3 is to seek an appropriate balance between intergenerational and period-to-period IPE, that is, between demographic matching and volatility management.

Policy objective 2 (and the resulting objective of balancing policy objectives 2 and 3) depends on the presumed ongoing status of the public sector plan and its sponsors. The level of volatility management appropriate to a funding policy may be less for plans where this presumption does not apply, e.g., plans that are closed to new entrants.

Note that the model funding policies developed here are substantially driven by these policy objectives. In some situations other plan features or policies (e.g., investment policy, reserving requirements, plan maturity) may also be a consideration in setting funding policy. Such considerations are not addressed in this analysis.

**Principal Elements of Actuarial Funding Policy:**

~~A~~The type of comprehensive actuarial funding policy developed here is made up of three components:

1. An **actuarial cost method**, which allocates the total present value of future benefits to each year (Normal Cost) including all past years (Actuarial Accrued Liability or AAL).
2. An **asset smoothing method**, which reduces the effect of short term market volatility while still tracking the overall movement of the market value of plan assets.
3. An **amortization policy**, which determines the length of time and the structure of the increase or decrease in contributions required to systematically (1) fund any Unfunded

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Actuarial Accrued Liability or UAAL, or (2) recognize any “Surplus”, i.e., any assets in excess of the AAL.

An actuarial funding policy can also include some form of “direct rate smoothing”. Two types of direct rate smoothing policies were evaluated for this development:

1. Phase-in of certain extraordinary changes in contribution rates, e.g., phasing-in the effect of assumption changes element over a three year period.
2. Contribution “collar” where contribution rate changes are limited to a specified amount or percentage from year to year.

**Actuarial Cost Method** – allocates the total present value of future benefits to each year (Normal Cost) including all past years (Actuarial Accrued Liability or AAL).

**Policy objectives and considerations specific to the Actuarial Cost Method**

1. Each participant’s benefit should be funded under a reasonable allocation method by the expected retirement date(s), assuming all assumptions are met.
2. Pay-related benefit costs should reflect anticipated pay at anticipated decrement.
3. The Normal Cost should be reasonably related to the expected cost of the member’s benefit.
4. The expected cost of each year of service, generally known as the Normal Cost or service cost, should emerge as a level percentage of member compensation<sup>4</sup>.
5. No gains or losses should occur if all assumptions are met, except for
  - a. Investment gains and losses deferred under an asset smoothing method consistent with these model practices, or
  - b. Contribution losses due to the phase-in of a contribution increase.
6. The cost method should allow for a comparison between plan assets and the accumulated value of past Normal Costs for current participants, generally known as the Actuarial Accrued Liability.

**Discussion**

1. Any actuarial cost model for retirement benefits begins with construction of a series or array of Normal Costs which, if funded each year, under certain stability conditions will be sufficient to fund all projected benefits for current active members. The following considerations serve to specify the cost model developed here.
  - a. The usual stability conditions are that the current benefit structures and actuarial assumptions have always been in effect, the benefit structures will remain in effect, future experience will match the actuarial assumptions. Special considerations apply if in the

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<sup>4</sup> This objective applies most clearly to benefits (like, for example, most public pension benefits) that are determined and budgeted for as a percentage of individual and aggregate salary, respectively. For benefits that are not pay related it may be appropriate to modify this objective and the resulting policies accordingly.

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past the benefit structure has been changed for current active members changing the benefits for members with service after some fixed date.

- b. Consistent with Cost Method policy objective #3 and with the General Policy Objective of transparency, the normal cost for each member is based on the benefit structure for that member. This means that a separate Normal Cost array is developed for each tier of benefits within a plan. This argues against Ultimate Entry Age.
- c. Consistent with Cost Method policy objective #4, the Normal Cost is developed as a level percentage of pay for each member, so that the Normal Cost rate (as a percentage of pay) is designed to be the same for all years of service. This provides for a more stable Normal Cost rate for the benefit tier in case of changing active member demographics. This argues against Projected Unit Credit.
- d. Also consistent with Cost Method policy objective #4, the Normal Cost for all types of benefits incurred at all ages is developed as a level percentage of the members career compensation. This argues against funding to decrement.
- e. Consistent with Cost Method policy objective #6, the Normal Cost is developed independent of plan assets, and the Actuarial Accrued Liability (and so also the UAAL) is based on the Normal Costs developed for past years. This argues against Aggregate and FIL except as implicit amortization policies under Entry Age.

- 2. Consistent with all the above, under the cost model developed here the Normal Cost rate should change only when the projected benefits for the tier change either in amounts or in present value.

- a. The Normal Cost rate (both in total and by member) will vary from valuation to valuation due to demographic experience and assumption changes.
- b. The Normal Cost rate will not change when an individual member reaches an age or service where, under the consistent benefit structure for the member's tier, the member's benefit eligibility or accrual rate changes. This is because that event was anticipated in the projected benefits for the tier, so that the projected benefits are substantially unaffected by such predictable changes in eligibility or benefit accrual.
- c. Similarly the Normal Cost rate for a member should be unaffected by the closing of the member's tier and the creation of a new tier for future hires.

- d. However, if the benefit structure of a continuing, open tier is changed for members with service after some fixed date, then the Normal Cost rate should change to reflect the unanticipated change in projected benefits for members in the tier<sup>5</sup>. This calls for an ~~as yet uncalled for~~ extension or variation of the Entry Age method in order to value this type of benefit change.

- i. There are two methods in practice to adjust the Normal Cost rate for this type of plan change. While a detailed analysis of these two variations is beyond the scope of this discussion, our summary conclusions are:

- A. The "replacement life" Entry Age method would base the Normal Cost on the new benefit structure as though it had always been in place, thereby producing a consistent Normal Cost rate for all members in the tier. This has the advantages of

<sup>5</sup> Note that, as of this writing, for public sector pension plans this is relatively uncommon because of legal protections that are understood to apply both to accrued benefits and to future benefit accruals for current members.

a change in Normal Cost more consistent with what would be expected for a change in future benefit accruals, a stable future Normal Cost rate for the tier and a relatively smaller (compared to the alternative) change in Actuarial Accrued Liability. Its disadvantages are that it is more complicated to explain and to implement, and it is currently the less common practice.

- B. The “averaged” Entry Age method would base each member’s Normal Cost on the new projected benefit for that member, thereby producing a different Normal Cost rate for different members in the tier, based generally on their service at the time of the change in benefit structure. The advantages and disadvantages are essentially the reverse of those for the replacement life version of Entry Age. The change in Normal Cost is less than what would be expected for a change in future benefit accruals, the future Normal Cost rate for the tier will be unstable (as it eventually reaches the same rate as under the replacement life variation) and there is a relatively larger (compared to the alternative) change in Actuarial Accrued Liability. Its advantages are that it is less complicated to explain and to implement, and it is currently the more common practice.

#### Model Practices

- Entry Age method with level percentage of pay Normal Cost
  - Level normal costs even if benefit accrual or eligibility changes with age or service
  - All types and incidences of benefits funded over a single measure of expected future service
  - Exception: for plans with benefits unrelated to compensation the Entry Age method with level dollar Normal Cost may be more appropriate
- For multiple tiers: Normal Cost based on each member’s benefit
- For benefit formula or structure changes within a tier (generally after a fixed date):
  - Normal Cost based on current benefit structure (“replacement life” Entry Age)

#### Alternative Model Practices

- Aggregate method: The Aggregate method should be considered as an implicit amortization policy under the Entry Age method.
  - Calculate Normal Cost and UAAL under Entry Age method.
  - Determine single amortization period for the Entry Age UAAL that, combined with the Entry Age Normal Cost, is equivalent to Aggregate method Normal Cost.
  - Evaluate the resulting amortization period according to the model UAAL amortization policies developed in a later section of these model practices.
- ~~For benefit formula or structure changes within a tier (generally after a fixed date):~~
  - ~~Normal Cost based on each member’s composite projected benefit (“averaged” Entry Age)~~
  - ~~Also calculate and disclose Normal Cost based on current benefit structure (“replacement life” Entry Age)~~

#### Acceptable Practices

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- Projected Unit Credit cost method
- “Frozen Initial Liability” method: This method should be considered as combination of an explicit amortization of part of the UAAL and an implicit amortization of the remainder, all under the Entry Age method.
  - Calculate Normal Cost and UAAL under Entry Age method.
  - Deduct the FIL amortization bases from the Entry Age UAAL.
  - Determine single amortization period for the remaining Entry Age UAAL that, combined with the Entry Age Normal Cost, is equivalent to FIL method Normal Cost.
  - Evaluate the resulting amortization period according to the model UAAL amortization policies developed in a later section of these model practices.
- “Funding to Decrement” Entry Age method, where each type and incidence of benefit is funded to each age at decrement
  - May be appropriate for some plan designs or for plans closed to new entrants<sup>6</sup>
- For benefit formula or structure changes within a tier (generally after a fixed date):
  - Normal Cost based on each member’s composite projected benefit (“averaged” Entry Age)

#### Acceptable but Not Generally Recommended Practices

- ~~“Funding to Decrement” Entry Age method, where each type and incidence of benefit is funded to each age at decrement~~
  - ~~While this is an acceptable variant of the Entry Age method, it is relatively rare in practice and so introduces an inconsistency with general actuarial practice.~~
  - ~~May be appropriate for some plan designs or for plans closed to new entrants~~
- The Aggregate or Frozen Initial Liability methods without the analysis of such methods as an implicit amortization policy under the Entry Age method, as discussed above.

#### Non-recommended Practices

- Normal Cost based on open tier of benefits even for members not in that open tier (“Ultimate” Entry Age)
  - Exception for benefit variations other than the basic benefit percentage or dollar amounts, e.g., final average earnings period

#### Unacceptable Practices

- Traditional (non-Projected) Unit Credit cost method for plans with pay-related benefits
- Note that while this document does not address policy issues related “pay-as-you-go” funding or “terminal” funding, such practices would be unacceptable if the policy intent is to fund the members’ benefits during the members’ working career.

<sup>6</sup> For example, a Plan that provides very valuable early career-benefits (such as heavily subsidized early retirement or disability benefits) may prefer to have the higher early-career Normal Costs associated with the “Funding to Decrement” Entry Age method.



**Asset Smoothing Methods** -- reduces the effect of short term market volatility while still tracking the overall movement of the market value of plan assets

**Policy objectives and considerations specific to Asset Smoothing Method**

1. The funding policy should specify all components of asset smoothing method.
  - a. Amount of return subject to deferred recognition (smoothing)
  - b. The smoothing period or periods
  - c. The range constraints on smoothed value (“market value corridor”), if any
  - d. The method of recognizing deferred amounts: fixed or rolling smoothing periods
2. The asset smoothing method should be unbiased relative to market
  - a. The same smoothing period should be used for gains and for losses
  - b. Any “market value corridors” should be symmetrical around market value
  - c. The asset smoothing method should not be selectively reset at market value only when market value is greater than actuarial value.
3. The asset smoothing method should be unbiased relative to realized vs unrealized gain loss
  - a. Deferrals based on total return gain/loss relative to assumed earnings rate?
4. The asset smoothing method should incorporate the ASOP 44 concepts of:
  - a. Likely to return to market in a reasonable period AND likely to stay within a reasonable range of market, or
  - b. Sufficiently short period to return to market OR sufficiently narrow range around market
5. The policy parameters should reflect empirical experience from recent market volatility.
6. The asset smoothing method should support the General Policy Goals of accountability and transparency. This leads to a preference for smoothing methods that provide for full recognition of deferred gains and losses in the UAAL by some date certain.
  - a. Note that this objective is also consistent with the demographic matching aspect of General Policy Goal #2

**Discussion**

1. Longer smoothing periods generally reduce contribution volatility. A discussion of ~~longer~~ smoothing periods could include the following considerations:
  - a. To the extent that smoothing periods are considered as being tied to economic or market cycles, those cycles may be believed to be longer than in past years.
  - b. Markets may be believed to be more volatile, ~~so in which case~~ longer smoothing ~~is would~~ needed just even if only to maintain former levels of contribution stability
  - c. More mature plans and higher benefit plans (i.e., plans with a higher “volatility index”) have inherently more volatile contribution rates, so may justify longer smoothing.
  - d. Sponsors may be more sensitive to contribution volatility.
2. However, ASOP 44 implies that longer smoothing periods call for narrower market value corridors
  - a. In effect, the corridor imposes a “demographic matching” style constraint on the use of longer smoothing periods to obtain greater volatility management.



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3. Our panel consensus is that five year smoothing is “sufficiently short” under ASOP 44
  - a. Long and consistent industry practice, as well as the GASB Exposure Draft
  - b. This implies that five year smoothing with no market value corridor is ASOP compliant
  - c. It still may be useful to have market value corridor as part of asset smoothing policy.
    - i. This avoids having to introduce the corridor structure in reaction to some future discussion of longer smoothing periods.
4. Consider the extensive recent data available on the impact of smoothing periods and market value corridors after large market downturn (such as occurred in 2008)
  - a. The smoothing method manages the transition from periods of lower cost to periods higher cost
    - i. The level of those higher costs is determined primarily by size of the market loss and UAAL amortization period, not the asset smoothing policy
  - b. The smoothing period determines length of the transition period
  - c. The market value corridor determines cost pattern during the transition.
    - i. A wide corridor or no corridor produces a straight line transition
    - ii. “Hitting the corridor” accelerated the cost increases in early years of transition
      - A. In effect the corridor inhibits the smoothing method after years of large losses (or gains)
    - iii. There are various possible policy justifications for such an accelerated transition.
      - A. Market timing: get more contributions in while the market is down (buy low ...)
      - B. Cash flow management: low market values may impair plan liquidity
      - C. Employer solvency: if the employer eventually is going to default on making contributions, get as much contribution income as possible before that happens.
      - D. Employer preference to have the higher costs in their rates as soon as possible.
    - iv. Following the 2008 market decline, these justifications were generally not found to be compelling
      - A. The normal lag in implementing new contributions rates defeats A and B.
      - B. Employers are presumed solvent and if not accelerating contributions would make things worse.
      - C. Many employers clearly preferred more time to absorb the contribution increases.
    - v. Absent these considerations, 2008 experience argues for permitting a wide corridor with five year smoothing period, as five year smoothing actuarial value to market value ratios exceeded 140%.
      - A. Projections in early 2009 actually showed these ratios could have been as high as 150% if markets had not recovered some before the June 30, 2009 valuations.
  5. Other industry indicators for market corridor selection with long smoothing periods
    - a. CalPERS 2005 policy: 15 year smoothing with 20% corridor
    - b. GASB Preliminary Views: “infinite” smoothing with 15% corridor
      - i. Note that while the subsequent GASB Exposure Draft proposes an entirely different (shorter) approach to asset smoothing, the Preliminary Views were consistent with association of narrower corridors with longer smoothing periods
  6. Structural issue: Fixed, separate smoothing periods vs. a single, rolling smoothing period.

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- a. Fixed, separate smoothing periods for each year of market gain or loss insure that all deferred gains and losses are included in the UAAL (and so in the contribution rates) by a known date. Consistent with accountability and with demographic matching.
- b. A single rolling smoothing period avoids “tail volatility” where contributions are volatile not only when gains and losses occur but also when each year’s gain or loss is fully recognized. Consistent with volatility management.
- c. With fixed, separate smoothing periods, tail volatility due to alternating periods of market gains and losses can be controlled by limited active management of the separate deferral amounts, including restarting the smoothing method whenever the actuarial and market values are very close together.
  - i. However restarts of fixed, separate smoothing periods should not be used:
    - A. Too frequently, produce a de facto rolling smoothing period, or
    - B. To selectively restart smoothing at market value only when market value is greater than actuarial value

#### Model Practices

- Fixed smoothing periods
- Maximum market value corridors for various smoothing periods
  - 5 years, 50%/150% corridor
  - 7 years, 60%/140% corridor
  - 10 years, 70%/130% corridor
  - 15 years, 80%/120% corridor
- Combine smoothing periods or restart smoothing only to avoid “tail volatility”
  - Avoid using frequent restart of smoothing to achieve de facto rolling smoothing
  - Avoid restarting smoothing only accelerate recognition of deferred gains, i.e., only when market value is greater than actuarial value
- Additional analysis, such as solvency projections, is likely to be appropriate for closed plans

#### Acceptable Practices

- Five year (or shorter) smoothing with no corridor
- Rolling smoothing periods subject to the above corridors, with additional analysis and possible constraints
  - Projections of when the actuarial value is expected to return within some narrow range of market value.
  - Consider some explicit constraint, such as that actuarial value expected to be within 5% of market value within 10 years, if market value of assets earns assumed investment return over same period.

#### Non-recommended Practices

- Longer than 5 year smoothing with no corridor

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**Unacceptable Practices**

- Smoothing periods longer than 15 years

**Unfunded Actuarial Accrued Liability Amortization Policy** – determines the length of time and the structure of the increase or decrease in contributions required to systematically (1) fund any Unfunded Actuarial Accrued Liability or UAAL, or (2) recognize any “Surplus”, i.e., any assets in excess of the AAL

**Policy objectives and considerations specific to Amortization Policy**

1. Variations in contribution requirements from simply funding the Normal Cost will generally arise from gains or losses, method or assumption changes or benefit changes and will emerge as an Unfunded (or prefunded) Actuarial Accrued Liability (UAAL). As discussed in the general policy objectives, such variations should be funded over periods consistent with an appropriate balance between the policy objectives of “demographic matching” and “volatility management”.
2. As with the Normal Cost, the cost for changes in UAAL should emerge [be treated as emerging] as a level percentage of member compensation.<sup>7</sup> [this alternative text anticipates level dollar amortization discussion]
3. The amortization policy should reflect explicit consideration of these different sources of change in UAAL, even if the resulting policy treats different changes in the same way:
  - a. Experience gains and losses
  - b. Changes in assumptions and methods
  - c. Benefit or plan changes
4. The amortization policy should reflect explicit consideration of the level and duration of negative amortization, if any.
  - a. This consideration should not necessarily preclude some negative amortization that may occur under an amortization policy that is otherwise consistent with the policy objectives.
  - b. Amortization periods developed in consideration of negative amortization (along with other policy goals) may be relevant for level dollar amortization (where negative amortization does not occur). [this text anticipates level dollar amortization discussion]
5. The amortization policy should support the general policy objectives of accountability and transparency. This leads to a preference for:
  - a. Amortization policies that reflect a history of the sources and treatment of UAAL
  - b. Amortization policies that provide for a full amortization date for UAAL
    - i. Note that this objective is also consistent with the demographic matching aspect of general policy objective 2.
6. The amortization of Surplus requires special consideration, consistent with general policy objective 2

<sup>7</sup> As with the Normal Cost, this amortization policy objective applies most clearly to benefits (like, for example, most public pension benefits) that are determined and budgeted for as a percentage of individual and aggregate salary, respectively. For benefits that are not pay related it may be appropriate to modify this objective and the resulting policies accordingly

## Discussion

1. General preference for level percentage of pay amortization.
  - a. Consistent with policy objectives and with the Normal Cost under the Model Actuarial Cost Method
  - b. This discussion of amortization periods presumes level percentage amortization; level dollar amortization will be discussed separately as an alternative to level percentage amortization.
2. General preference for multiple, fixed amortization layers.
  - a. Fixed period amortization is clearly better for accountability, since UAAL is funded as of a date certain.
  - b. Single layer, fixed period amortization is not a stable policy, since period must be restarted when remaining period gets too short.
  - c. Multiple layer amortization is also more transparent, since it tracks the UAAL by source.
  - d. Discussion of periods will assume multiple, fixed amortization and then revisit the use of rolling periods to manage volatility.
3. For gains and losses, balancing “demographic matching” and “volatility control” leads to an ideal amortization period range of 15 to 20 years
  - a. Lesson learned from the 1990s is that less than 15 years gives too little “volatility control”, especially for gains
    - i. Short amortization of gains lead to partial contribution holidays (contributions less than Normal Cost) and even full contribution holidays (no contribution required).
    - ii. Inconsistent with general policy objective 2, led to insufficient budgeting for ongoing pension costs and to pressure for benefit increases.
  - b. Longer than 20 years becomes difficult to reconcile with “demographic matching”
    - i. Substantially longer than either average future service for actives or average life expectancy for retirees.
  - c. Longer than 20 years also entails negative amortization (which starts at around 16 to 18 years for most assumptions).
    - i. Here negative amortization is an indicator for not enough “demographic matching” but based on economic rather than demographic assumptions
    - ii. Remarkable consistency between the period of onset of negative amortization and the periods related to member demographics
  - d. Two case studies: CalPERS and GASB
    - i. CalPERS 2005 analysis focused on volatility management. Resulting funding policy uses exceptionally long amortization (and also asset smoothing) periods.
    - ii. GASB Exposure draft focuses on demographic matching. Resulting expensing policy uses exceptionally short amortization periods.
    - iii. Our general policy objectives indicate a balance between these two extremes.
4. For assumption changes, a case can be made for longer amortization than for gain/loss, since liabilities are remeasured to anticipate multiple years of future gains or losses.
  - a. A similar or even stronger case could be made for changing cost method from Projected Unit Credit to Entry Age.

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- b. However longer than 25 years entails substantial (arguably “too much”) negative amortization
- c. “25 is the new 30” for UAAL
- 5. For plan amendments, volatility management is not an issue, only demographic matching
  - a. Use actual remaining active future service or retiree life expectancy.
  - b. Could use 15 years as an approximation.
    - i. Longer than 15 years would entail negative amortization, so is not recommended.
  - c. For Early Retirement Incentive programs use a period corresponding to the period of economic savings to the employer.
    - i. Shorter than other plan amendments, typically around five years.
- 6. For Surplus, similar to short amortization of gains, the lesson from the 1990s is that short amortization of surplus leads to partial or full contribution holidays (contributions less than Normal Cost, or even zero)
  - a. Inconsistent with general policy objective 2, led to insufficient budgeting for ongoing pension costs and to pressure for benefit increases.
  - b. General consensus that this is not good public policy.
    - i. See for example Recommendation 7 by 2007 Governor’s Commission, and also CalPERS 2005 funding policy
  - c. Because of the ongoing nature of the Normal Cost, amortization of UAAL and Surplus should not be symmetrical.
    - i. Amortize Surplus over a period longer than would be acceptable for UAAL
  - d. Note that long amortization of Surplus does not preclude other approaches to Surplus management that are beyond the scope of this discussion.
    - i. Treating some level of Surplus as a non-valuation asset.
    - ii. Changing asset allocation to reflect Surplus condition.
- 7. Separate Surplus related issue: When plan first goes into Surplus, should existing UAAL amortization layers be maintain or eliminated?
  - a. Could maintain amortization layers and have minimum contribution of Normal Cost less 30 year amortization of Surplus (CalPERS policy)
  - b. However, maintaining layers can result in net amortization charge even though overall plan is in Surplus.
  - c. Alternative is to restart amortization.
    - i. In effect, 30 year rolling amortization of current and future Surpluses
    - ii. Restart amortization layers when plan next has a UAAL.
- 8. Level dollar amortization: fundamentally different from level percent of pay amortization
  - a. No level dollar amortization period is equivalent to a level percent period.
    - i. So, policy should avoid trading off level dollar amortization for a longer amortization period
  - b. Level dollar amortization is a policy decision separate from selecting amortization periods and method
    - i. Could be appropriate for plans where benefits are not pay related
    - ii. Could be appropriate for sponsors and plans that are particularly averse to future cost increases, e.g., utilities setting rates for current rate payers

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- iii. Could be appropriate for sponsors and plans that want an extra measure of conservatism or protection against low or no future payroll growth
- iv. Could be useful as a step in developing amortization payments in proportion to some basis other than payroll
- c. Policy impact of choosing level dollar amortization will be most clear if the same amortization periods are used.
  - i. This is true even though negative amortization (which only occurs under level percent of pay amortization) was one of the considerations in developing the amortization period ranges.
- 9. Multiple, fixed period layers vs. single, rolling period layer for gains and losses. .
  - a. Multiple, fixed amortization periods for each year's gain or loss ensures that all gains and losses are funded by a known date. Consistent with accountability and with demographic matching.
  - b. A single rolling smoothing period avoids "tail volatility" where contributions are volatile not only when gains and losses occur but also when each year's gain or loss is fully amortized. Consistent with volatility management.
  - c. With fixed, separate smoothing periods, tail volatility can be controlled by active management of the amortization layers, including combining consecutive gain and loss layers as necessary to reduce tail volatility.
- 10. Amortization periods for a single, rolling amortization period
  - a. Similar to level dollar, acknowledge that rolling amortization is fundamentally different from fixed period amortization.
  - b. Allow the same 15 to 20 year range, even though rolling is generally slower amortization than fixed.
    - i. Policy should avoid trading off rolling amortization for a shorter amortization period
- 11. Observation: two variations from the model practice are each treated as a separate policy decision.
  - a. Level dollar is generally faster than level percent of pay
  - b. Rolling amortization is generally slower than fixed period amortization

**Model Practice**

- Layered fixed period amortization by source of UAAL
- Level percent of pay amortization
- Amortization periods

Source	Period
Active Plan Amendments	Demographic or 15
Inactive Plan Amendments	Demographic or 15
Experience Gain/Loss	15 to 20
Assumption Changes	15 to 25
Early Retirement Incentives	5 or less

- 30 year amortization of surplus (for plans with ongoing Normal Cost)
  - Eliminate all prior UAAL layers upon going into Surplus

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- 20 to 25 year amortization of change from PUC to Entry Age
- Combine gain/loss (and other) layers or restart amortization only to avoid “tail volatility”
  - Avoid using restart of amortization to achieve de facto rolling amortization
  - Restart amortization layers when moving from Surplus to UAAL condition
- Additional analysis, such as solvency projections, is likely to be appropriate for closed plans

**Acceptable Practices**

- Level dollar fixed period layered amortization by source of UAAL, using the same model amortization periods as above
  - Ideally, with some rationale given if used with pay related benefits.
- Up to 20 year rolling amortization of a single combined gain/loss layer
  - With model periods for other sources of UAAL
  - Use separate, fixed period layers for extraordinary gain or loss events

**Acceptable but Not Generally Recommended Practices**

- Up to 25 year layered fixed period amortization by source, for all sources of UAAL
  - Ideally with some rationale given for using periods outside the model ranges
- 30 year fixed amortization of change from PUC to Entry Age
  - Ideally with some rationale given for using periods outside the model ranges

**Non-recommended Practices**

- Fixed period amortization of the entire UAAL as a single combined layer, with periodic reamortization over a new starting amortization period
- Layered fixed period amortization by source of UAAL over longer than 25 years
- Rolling/open amortization of entire UAAL as a single amortization layer
- Rolling/open amortization over longer than 20 years of a single combined gain/loss layer

**Unacceptable Practices**

- Layered fixed period amortization by source of UAAL over longer than 30 years
- Rolling/open amortization over longer than 25 years, whether for entire UAAL or for only a single combined gain/loss layer

**Comment [ppa1]:** More conservative approach (“25 is the new 30”) would make this “unacceptable”

**Comment [ppa2]:** More conservative approach (“25 is the new 30”) would say “25” here

**Direct Rate Smoothing**

An actuarial funding policy can include some form of “direct rate smoothing”, where the contribution rates that result from applying the three principal elements of funding policy are then directly modified. Two types of direct rate smoothing policies that are known to be in current practice were evaluated for this development:



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1. Phase-in of certain extraordinary changes in contribution rates, e.g., phasing-in the effect of assumption changes element over a three year period.
2. Contribution “collar” where contribution rate changes are limited to a specified amount or percentage from year to year.

**Discussion**

1. Contribution rate phase-in can be an effective and reasonable way to reflect the contribution rate impact of assumption changes
  - a. The phase –in period should be no longer than the time period until the next review of assumptions (experience analysis).
  - b. The plan and its sponsors should be clearly aware of the additional “time value of money” cost of the phase-in, due to the plan receiving less than the actuarially determined contributions during the phase-in.
  - c. Note that the phase-in of the contribution rate impact of an assumption change is clearly preferable to phasing in the assumption change itself. While a detailed discussion is outside the scope of this discussion, phasing in an assumption change may be difficult to reconcile with the governing actuarial standards of practice.
2. Contribution collars have the policy drawback that the collar parameters arbitrarily override the contribution results produced by the other funding policy parameters, each of which have a well developed rationale.
  - a. If contribution collars are used they should be supported by analysis and projections to show the effect on future funded status and future policy based contribution requirements (prior to the application of the contribution collar).
3. Using either form of direct rate smoothing for other than assumption changes (i.e., for actuarial experience or plan amendments) appears inconsistent with the development of parameter ranges for the other elements of the funding policy.

**Model Practice**

- None

**Acceptable Practices**

- Phase-in of the cost impact of assumption changes over a period no longer than the time period until the next review of assumptions (experience analysis), accompanied by disclosure of impact on contribution rates

**Acceptable but Not Generally Recommended Practices**

- Contribution collars in conjunction with model practices for asset smoothing and UAAL amortization, accompanied by disclosure of impact on contribution rates

**Non-recommended Practices**

- Contribution collars in lieu of model practices for asset smoothing and/or UAAL amortization

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- Phase-in of the cost impact of actuarial experience or plan amendments

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DISCUSSION DRAFT